

Claims

What is claimed is:

- 1     1.     A resist composition comprising (a) an imaging polymer, and (b) a  
2           radiation sensitive acid generator component, said radiation sensitive  
3           acid generator component comprising:  
4           (i)     a first radiation sensitive acid generator selected from the group  
5                   consisting of dissolution-inhibiting acid generators, and  
6           (ii)    a second radiation sensitive acid generator selected from the  
7                   group consisting of unprotected acidic group-functionalized  
8                   radiation sensitive acid generators and acid labile group-protected  
9                   acidic group-functionalized radiation sensitive acid generators.
- 1     2.     The resist composition of claim 1 wherein said imaging polymer  
2           comprises a ketal-functionalized acid sensitive polymer.
- 1     3.     The resist composition of claim 1 wherein said second  
2           radiation-sensitive acid generator is an acidic group-functionalized acid  
3           generator comprising an acidic moiety selected from the group  
4           consisting of phenolic moieties, carboxylic moieties and fluoroalcohol  
5           moieties.
- 1     4.     The resist composition of claim 1 wherein said second  
2           radiation-sensitive acid generator is an acid labile group protected acidic  
3           group-functionalized acid generator which is reactive with acid to form a  
4           pendant acidic moiety selected from the group consisting of phenolic  
5           moieties, carboxylic moieties and fluoroalcohol moieties.
- 1     5.     The composition of claim 1 wherein said resist composition contains  
2           at least about 4 wt.% of said radiation sensitive acid generator  
3           component based on the weight of said imaging polymer.

- 1     6.     The composition of claim 1 wherein said first and second acid  
2           generators are present in a mole ratio of about 5:1 to about 1:5.
- 1     7.     A method of forming a patterned material structure on a substrate using  
2           the resist composition of any of claims 1 to 6, said material being  
3           selected from the group consisting of organic dielectrics,  
4           semiconductors, ceramics and metals, said method comprising:
- 5           (A)    providing a substrate with a layer of said material,
- 6           (B)    applying a resist composition according to any of claims 1 to 8 to  
7           said substrate to form a resist layer on said substrate;
- 8           (C)    patternwise exposing said substrate to radiation whereby acid is  
9           generated by acid generator of the resist in exposed regions of  
10          said resist layer by said radiation,
- 11          (D)    contacting said substrate with an aqueous alkaline developer  
12          solution, whereby said exposed regions of said resist layer are  
13          selectively dissolved by said developer solution to reveal a  
14          patterned resist structure, and
- 15          (E)    transferring resist structure pattern to said material layer, by  
16          etching into said material layer through spaces in said resist  
17          structure pattern.
- 1     8.     The method of claim 7 wherein at least one intermediate layer is  
2           provided between said material layer and said resist layer, and step (E)  
3           comprises etching through said intermediate layer.

- 1 9. The method of claim 7 wherein said radiation is selected from the group  
2 consisting of electron projection radiation, EUV radiation, and soft x-ray  
3 radiation.
- 1 10. The method of claim 7 wherein said substrate is baked between steps  
2 (C) and (D).